

REMARKS

Disposition of Claims

Upon entry of the foregoing amendments, claims 1-2, 4, 10, 14-19, 21-25, 27, and 30-35 will remain pending in the application and stand ready for further action on the merits. Independent claims 1 and 27 have been amended to clarify that each vertical arm of the rotary indexer has a vacuum cup for picking-up, holding and carrying the object (preferably, a golf ball) to orienting stations using vacuum suction so the object does not rotationally slip as it is being transferred from station-to-station. Each orienting station has a rotating object holder with a vacuum cup for receiving the object from the vacuum cup of the rotary indexer. Thus, vacuum cups are engaged with the object during the entire transfer process. The vacuum cups on the rotary indexer transfer the object to three different orienting stations so the object can go through three distinct rotational movements about perpendicular axes. That is, the golf ball is analyzed by moving the ball to different stations and rotating the ball to a different position at each station. These claim amendments are supported throughout the specification, particularly at page 8, lines 25-30; by the drawings, particularly Figs. 2 and 2a; and by the originally filed claims. No new matter has been added to the application.

Claim Rejections under 35 U.S.C. §103

The Office Action rejects claims 1-2, 4, 10, 14-18, 21-22, 24-25, and 30-35 under 35 U.S.C. §103(a) as being unpatentable over Gordon et al., U.S. Patent 5,632,205 ("Gordon") in view of Carlson, U.S. Patent 7,283,657 ("Carlson") and Osterfeld, U.S. Patent Application Publication 2002/0092731 ("Osterfeld"). In response, applicants respectfully submit that the combination of Gordon, Carlson, and Osterfeld does not render the presently claimed invention, as recited in the amended claims, prima facie obvious for the reasons discussed below.

Applicants agree with the Examiner that Gordon discloses a method of orienting a spherical object, such as a golf ball, that involves using a camera to image the object and a camera for processing the image and for computing a spatial rotation. The object is brought into the desired spatial orientation using conical wheels to support the ball and rotate it around an axis. As the Examiner recognizes, the Gordon method uses a single station to perform the entire orientation of the ball. There is no transfer mechanism disclosed in Gordon. The ball is not transferred from

orienting station-to-orienting station. However, the Examiner takes the position that it would have been obvious to use the transfer system described in Carlson in the method of Gordon and thus asserts that applicant's invention is *prima facie* obvious.

Turning to Carlson, applicants agree with the Examiner that this reference discloses a system for automatically orienting a spherical object, particularly a golf ball, which involves certain processing steps at four separate work stations. Referring to Figs. 7-10 in Carlson, the method involves picking up the golf ball from the starting cup (60) at the first station (ST0) with a first transporting mechanism (76). The mechanism grips the ball and pivots through a fixed 90 degree arc, thus placing the ball in the bottom cup (62) of the first work station (ST1). The upper cup (66) is activated to hold the golf ball securely in the bottom cup (62). The transporting mechanism then releases the ball and rotates back to a position midway between the work stations (ST0 and ST1). The golf ball is released at the first work station (ST1) by retracting the upper cup (66) which holds the ball in the bottom cup (62). Then, the ball is conveyed from the first work station (ST1) to the second work station (ST2) by means of the second transporting mechanism (78) operating similarly to the first transporting mechanism (76) (col. 13, lines 53-67 and col. 14, lines 41-51.)

Thus, in Carlson, the object (O) is picked-up from the starting cup (60) by a mechanical gripper transporting mechanism (76).

FIG. 9b depicts a side view of a single transposing mechanism 76 made up of a mechanical gripper 76 that is pneumatically operated and a pair of gripper pads 96, 96a made from low durometer polyurethane rubber to prevent the spherical object O from moving relative to the gripper 76, when the spherical object O is conveyed through the fixed arc of 90 degrees. (col. 13, lines 29-37).

There is no disclosure or suggestion in Carlson for using vacuum suction for picking-up, holding and carrying the object to an orienting station so the object does not rotationally slip during transfer from station-to-station as claimed by applicants. It is respectfully submitted the upper

cups (66) in the system described by Carlson are not used for picking-up and transporting the object. Rather, the upper cups (66) in Carlson are used to simply hold the object in place – the cup moves “up and down for the purpose of exerting a force on the spherical object O to hold it securely against the opposing bottom cup (62)” (col. 12, lines 18-22). There is no disclosure or suggestion in Carlson for using vacuum cups to pick-up, carry and place the golf balls in different work stations. As opposed to Carlson, Applicants have developed a system, wherein vacuum suction cups are engaged in the entire process, particularly picking-up the ball, carrying it, and placing it in position on a second vacuum cup that receives the ball. Using vacuum cups is an important feature of applicants’ system because they prevent the ball from rotationally slipping during the indexing motion. The ball does not rotationally slip as it is being transferred from station-to-station. The vacuum cups keep the ball in its properly rotated position during the entire process. For example, the ball may be first transferred from imaging station (10) to first orienting station (40), where it is rotated about vertical axis (V). The ball is then transferred in its rotated position to second orientating station (50), where it is rotated about horizontal axis (H). Finally, the ball is transferred in its newly rotated position to third orienting station (60), where it is rotated about vertical axis (V).

Keeping the ball in its properly rotated position as it is being picked-up, transferred, and placed in each orienting station is critical to applicants’ method. Once the ball is rotated to a first position in one orienting station, it is important for the ball to remain in that position until it is ready to be rotated to a second position in the next orienting station. The ball needs to be held in place between each rotation. Applicants’ system works well because the vacuum cups tightly and precisely hold the ball in place as it is being moved out of one station and into another.

Applicants’ transfer mechanism is completely different than the system disclosed in Carlson, which uses mechanical grippers to pick-up and carry the object. It is respectfully submitted that Carlson does not provide any guidance or suggestion to a person of ordinary skill in the art for a rotary indexer having multiple vacuum cups for picking-up, holding and carrying the ball to different orienting stations. Thus, a skilled artisan looking at Carlson would only be guided to develop the presently claimed invention by further looking at applicants’ own specification. It is

respectfully submitted that such hindsight reconstruction of the claimed invention to render it prima facie obvious is not permitted.

Even if a person of ordinary skill in the art turned to Osterfeld, it is respectfully submitted the present invention still would not be obvious. Applicants agree with the Examiner that Osterfeld discloses a gripper system for transporting a cylindrical workpiece and the system includes a rotary indexer. The system can be used to transport a filter cartridge along a conveyor belt. The system includes a gripper apparatus having pivotally connected jaw members that open and close in response to a relatively short linear movement of an actuator. After the filter element has been grasped by the gripper jaws, the gripper assembly moves the filter, via a conveyor belt, to an end-cap mounting station, where two end-caps are simultaneously placed on opposite ends of the filter element. The end-caps move on the conveyor to a rotary indexer, where they are filled with uncured plastisol resin. The adhesive-filled end caps are then connected to the filter element. However, there is no disclosure or suggestion in Osterfeld for a transfer mechanism that includes taking and analyzing an image of a golf ball at an imaging station, determining the correct orientation analysis, and transferring the ball to different orientation stations using a rotary indexer having multiple vacuum cups for picking-up, holding and carrying the ball. Thus, it is respectfully submitted that even if the teachings in Osterfeld were combined with the teachings in Gordon and Carlson, the presently claimed invention as recited in claims 1-2, 4, 10, 14-18, 21-22, 24-25, and 30-35 would not be obvious. In view of the foregoing, it is respectfully requested that the rejection of these claims under 35 U.S.C. §103(a) in view of Gordon, Carlson, and Osterfeld be withdrawn.

Next, the Office Action rejects claim 19 under 35 U.S.C. §103(a) as being unpatentable over Gordon in view of Carlson and Carlson and further in view of Gentiluomo, U.S. Patent 3,778,067 ("Gentiluomo"). Claim 19 is ultimately dependent upon amended claim 1. Applicants believe that amended claim 1 is in condition for allowance for the reasons discussed above and claim 19 should be allowed accordingly.

Addressing the Gentiluomo reference, this patent is directed to a golf ball teeing apparatus having a reciprocating tee to elevate the ball from a lower ball receiving position to either an

intermediate ball hitting position or an upper ball hitting position; a ball dispensing means for storing a plurality of balls; and a ball receptacle for receiving or storing balls. The tee elevation can be selected either manually by push button or automatically through program control. The apparatus uses gear motors, switches, solenoids, photoelectric proximity switches, acceptor units, and the like that are commercially available components. However, Gentiluomo does not teach a rotary indexer having multiple vacuum cups for picking-up, holding, and carrying the ball to orienting stations, each station having a vacuum cup for receiving the ball so the ball does not rotationally slip during transfer from station-to-station.

In view of the foregoing, it is respectfully requested the rejection of claim 19 under 35 U.S.C. §103(a) over Gordon, Carlson, Osterfeld, and Gentiluomo, taken alone or in combination, be withdrawn.

Lastly, the Office Action rejects claim 23 under 35 U.S.C. §103(a) as being unpatentable over Gordon in view of Carlson and Osterfeld and further in view of Welchman et al., U.S. Patent Application Publication 2001/0012389 ("Welchman"). As the Examiner recognizes, claim 23 is dependent upon amended claim 1. Applicants believe that amended claim 1 is in condition for allowance for the reasons discussed above. Thus, dependent claim 23 should be allowable as well. The Gordon, Carlson, and Osterfeld references are discussed in detail above.

Addressing Welchman, this reference is directed to an automated golf ball inspection system for determining the quality of surface treatments (for example, primer coatings, ink, or paint) applied to golf balls. The coated golf ball is inspected for quality using a camera or photocell imaging device. As the Examiner points out, the inspection system may include two high resolution cameras that transmit electrical signals to an analyzer. Different signals may be transmitted based on the field of view by the camera (Para. 40). However, there is no disclosure or suggestion in Welchman for a transfer mechanism that includes taking and analyzing an image of a golf ball at an imaging station, determining the correct orientation analysis, and transferring the ball to different orientation stations using a rotary indexer having multiple vacuum cups for picking-up, holding and carrying the ball.

In view of the foregoing, it is respectfully requested the rejection of claim 23 under 35 U.S.C. §103(a) over Gordon, Carlson, Osterfeld, and Welchman, taken alone or in combination, be withdrawn.

Conclusion

In summary, applicants submit that claims 1-2, 4, 10, 14-19, 21-25, 27, and 30-35 (as amended) are patentable and each of the Examiner's objections and rejections has been overcome. Accordingly, applicants respectfully request favorable consideration and allowance of amended claims 1-2, 4, 10, 14-19, 21-25, 27, and 30-35.

The Commissioner is hereby authorized to charge any fee required in connection with the filing of this paper or credit any overpayment to Acushnet Company, Deposit Account No.: 502309. Should there be any outstanding matter that needs to be resolved in the present application; the Examiner is invited to contact the undersigned at the telephone number provided below.

Respectfully submitted,

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